

Ontario universities provincial leaders in job creation

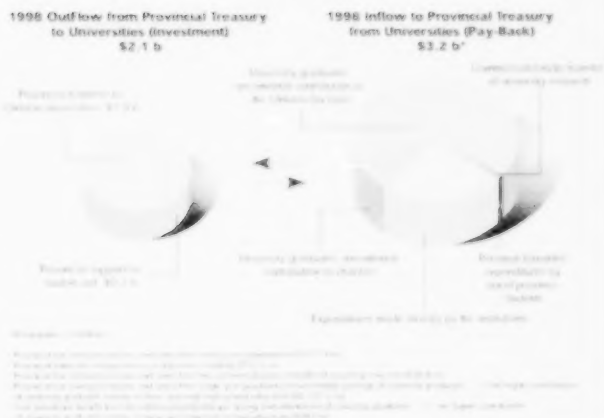
Study finds employment per dollar and employment impact exceed other major sectors

Ontario universities are major contributors to economic growth and job creation in the province, directly or indirectly sustaining more than 375,000 Ontario jobs, according to findings of a recent U.O. comment issued report by Enterprise Canada Research.

The University of Ontario annually invests just over \$2.1 billion in university education. Most of this investment flows directly into university operating grants, with the balance going to students in the form of bursarships and financial aid. The Economic Impact of Ontario's Universities finds that, in return for this direct \$2.1 billion investment, the province receives more than \$3.2 billion back in revenues generated directly and indirectly by the university sector.

The report finds that expenditures on university education are more potent economic stimulants than expenditures on almost any other good or service. For every job created or sustained through expenditures made by a university, another 0.88 of a job is created by the ripple effect of those expenditures through the economy. Sectors that have seen high employment per dollar "multipliers" (1.88 for Ontario universities) are judged to have a more potent job creation impact than sectors with lower multipliers. The university sector generally provides more employment per dollar than any other sector. Its employment impact is almost double that of the health/social services sector, and almost twice as high as the bars,

When considered as an "industry," the university sector is non-agricultural and employs. There are more people employed directly by Ontario universities (faculty and staff) than there are by the Canadian broadcasting sector, the national advanced training/learning sector, or the country's aerospace industry. Yet fewer than a quarter of the jobs generated or sustained by Ontario universities are found at the universities themselves. Most of the job creation in universities is spurred by the expenditures of faculty and staff, institutional spending on materials and goods, the taxable personal expenditures of out of province students, the economic activity arising from the consumerization (transfer of university research) and the additional earnings (and therefore expenditures) of university graduates relative to taxpayers/consumers with a high school education.



How Ontario Universities Contribute to Economic Growth and Job Creation

1. Through the impact of expenditures made directly by the institutions.

Ontario universities spent approximately \$4.7 billion in 1998, of which roughly 40 percent was provided by the provincial government. This initial expenditure is transferred and/or more than \$10 billion in economic activity as the spending circulates through the economy. This spending generated an estimated 196,536 person-years of employment, divided roughly evenly between direct impact – 104,335 person-years and indirect impact – 90,091 person-years. (Note: In Enterprise Canada's methodologies, a job is

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defined as the equivalent of one person-year of full-time employment.) This is a moderate estimate of jobs compared to relevant calculations from Statistics Canada.

2. Through the commercialization/transfer of university research.

The economic impact of university-based research and development (R&D) may show up in many ways — from the consulting activity of individual faculty members to the

start-ups. Enterprise Canada speculates that the economic impact of licensing activity could be three times higher than the estimates given here.

3. Through the impact of university graduates' higher average income and spending power relative to other taxpayers and consumers.

The findings make it clear that public investment in Ontario students makes good economic sense for the

There are an estimated 136 companies operating in Ontario as a result of direct university linkages.

creation of new spin-off companies, to the movement of graduates with innovative ideas and capabilities into the commercial environment, to the attraction of new capital investment to the province. Science and technology companies are known to conglomerate and economic clusters to form near research-intensive universities, with the resulting impact on local job creation. University R&D also generates economic growth in other ways, such as the licensing of innovations — it is estimated that every dollar spent on licensing may trigger 20 cents in pre-production expenditures. There is also likely to be substantial equity investment to bring new products and services to market.

Presently, there is no precise way of estimating the full value of university-based innovation on economic growth. But a low-end estimate that uses only three of the possible components — economic activity generated by spin-off companies in a single year, the pre-production activity associated with licensing, and the paid consulting carried out by faculty — shows that the direct and indirect inflows to the provincial treasury was \$38.8 million in 1998 and that some 2,400 jobs were sustained by this economic activity. These estimates do not include the unmeasured economic impact of licensing to existing companies. Industry Canada estimates that in 1997, the traffic in Canadian university licensing to existing companies was of approximately the same magnitude as licensing to

province as well as for the individuals who earn a degree. Ontario receives a lifetime of public pay back from its university graduates.

Our universities prepare Ontario graduates for ongoing success in the workforce. The most recent survey of Ontario university graduates from Class of '97 undergraduate program shows that they have achieved an overall employment rate of 96.4 percent after two years out. Preliminary findings from the Class of '98 suggest that the rate has increased to over 97.7 percent two years after graduation. Among Class of '97 graduates who are employed full time, 81 percent hold jobs that are "closely or 'somewhat' related to their university education."

These productively employed, well-paid citizens are not only holding jobs, but also creating jobs and economic opportunity for other Ontarians, at a level over and above the contribution of Ontarians who have only a high school education.

Average personal income increases substantially with level of educational attainment. Statistics Canada findings indicate that a university degree commands the highest average income among different types of education. The earnings of university graduates are substantial soon after graduation and continue to grow as their careers progress.

By comparing the lifetime earnings of university graduates to those of high school graduates, Enterprise Canada was able to estimate the additional earnings enjoyed by university graduates over their working

High Employment Rates for University Grads

Timing of employment rates among university graduates, by year: 1995-2000



University graduates' higher annual contribution to the provincial tax base repays Ontario's annual investment in its universities.

lives. This differential shows a few much more our university graduates will contribute to the provincial tax base over their working lives than will high school graduates.

- Over the course of a working lifetime, the holder of a bachelor's degree will earn (before tax) an average of \$488,500 more than an individual who has graduated from high school.
- The holder of a bachelor's degree will have \$356,700 more after-tax income available than a high school graduate.
- The holder of a bachelor's degree will pay approximately \$115,100 more in income taxes than a high school graduate.

(relative to taxpayers with a high school education) added an additional \$2.1 billion to provincial coffers in 1998. \$1.72 billion in personal income taxes, and an estimated \$381.9 million in provincial sales tax revenue. This additional contribution over a single year equals the amount of public investment in Ontario universities in the same year.

The higher spending power of Ontario university graduates (relative to consumers with a high school education) is a powerful economic engine. In fact, the number of jobs created or sustained each year through the disposable income expenditures of university graduates is greater than the number of jobs created or sustained each year through the expenditures of the university system itself.

In 1998, university graduates spent \$6.78 billion more than their high school counterparts, directly or indirectly generating jobs at the rate of 20 person-years of employment per million dollars of expenditure. Ontario's entire population of university graduates thus created 169,425 additional person-years of employment in the province in 1998. A single year's cohort of degree holders sustained 11,389 additional jobs, directly or indirectly, over the same one-year period.

4. Through the taxable personal expenditures of out-of-province students.

Ontario universities also pay back to the province through the personal (taxable) expenditures of their out-of-province students. International and out-of-province students contributed \$13.5 million to the government in provincial sales tax revenues in 1998. It is estimated that their expenditures directly or indirectly sustained the equivalent of 8,821 full-time jobs.

Job Creation Summary: 1998

Note: In Enterprise Canada's methodology, a "job" is defined as the equivalent of one person-year of full-time employment.

Category	1998	1997	1996
Institutional expenditures	104,333	91,991	196,526
Out-of-province students' taxable personal expenditures	3,397	4,114	8,821
Commercialization/transfer of university research	1,347	1,077	2,419
Incremental expenditures by Ontario university graduates (1998 impact of a single year cohort)	7,967	3,796	11,389
Total "single year" job creation	117,876	101,279	219,155
Incremental earnings of Ontario university graduates (1998 impact of all years)	117,876	101,279	219,155
Total job creation in 1998 associated with the university sector*	117,876	101,279	219,155

*To prevent double-counting, the job creation associated with incremental earnings of university graduates (single year cohort) has been deducted from this total before adding in the cumulative earnings of all previous degree holders.

Source: Enterprise Canada Research.

Ontario universities vital contributors to provincial vitality

Ontario universities, considered a sector, have a major aggregate impact on the provincial economy. But they also make significant contributions as individual institutions, both economically and socially, within their own local communities, regions, and beyond.

Ontario universities place their resources at the service of their communities in several ways. First, bringing economic partnerships with industry and government to make their regions more competitive — to community development projects — to bringing their research to market as a public benefit — to protecting the environment — to facilitating the delivery of crucial social services — to developing new technologies — and fueling the growth of new industries. Ontario universities are making a vital difference in the life of the province.

The following examples provide a glimpse into the scope of the contributions that Ontario universities make to the province and its people, and remind us of the tremendous assets we possess in these public institutions.

CLUSTERING IN CANADIAN WINE INDUSTRY

As the only institute of its kind in North America, Brock University's state-of-the-art Cool Climate Oenology and Viticulture Institute (CCOVI) is a leader in education and research for the wine-making and grape-growing industries in Canada. CCOVI, along with the Wine Council of Ontario and the Ontario Grape Growers' Marketing Board, were recognized by the Confederation Board of Canada with the 1999 \$800 Diamond Chrysler Award for the best business education partnership in Canada.

LEADERSHIP INITIATIVE SUPPORTS COMMUNITY ECONOMIC DEVELOPMENT

Ucalton University is the force behind the single largest private effort in community economic development in Canada. The University's Centre for the Study of Training, Investment and Economic Restructuring works with rural and urban communities to help them find their own solutions to economic challenges, create jobs, and strengthen their communities. A technical assistance program has helped more than 100 communities with 30 professional groups across Canada, for help in planning, financing new enterprises employing low-income residents, and training in setting up local development corporations or small business loan funds.

CLUSTERING FOSTERS GROWTH OF NEW BIOECONOMY

The University of Guelph is at the forefront in the emerging field of life sciences — molecular genetics, food biotechnology, bioinformatics, and plant and animal research — which is expected to become Canada's economic corner stone during this century. With funding from government and industrial partners, the University has created a strong life sciences cluster in the Guelph region that is leading to the development of new, safe, high-quality products, creating hundreds of new jobs, and contributing more than \$95 million annually to the local economy in research-related funds.

PARTNERSHIP BRINGS CARE AND RESEARCH TO NEW CANCER THERAPY

Lakeland University has built many partnerships with health care professionals in Northwestern Ontario. A recent partnership with the Thunder Bay Regional Hospital has launched the construction of a new \$175 million, 375-bed acute care facility on 60 acres of land donated by Lakeland. The site will also become the new home for the Northwestern Ontario Cancer Research Centre,

strengthening a history of research collaboration between the two institutions, by helping them plan more strategically and leverage more resources in their search for knowledge.

HEALTHY, SUSTAINABLE NORTHERN CANADA

University of Waterloo's Cooperative Freshwater Ecology Unit, formed on the shores of Huron Lake in Sudbury, was formed in 1980 through a partnership of university, government, and industry scientists to address large-scale environmental problems in Northwestern Ontario.

Ontario Researchers are working to understand the functioning of industrially damaged aquatic systems — assess and monitor the process of recovery and rehabilitation of industrially damaged water, and develop and test rehabilitation techniques that speed up the recovery process.

SCIENTIFIC STRENGTH IN STEEL

Steel making has evolved into a technology-based industry that maintains its competitive edge through research and the development of new products and processes. McMaster University's Steel Research Centre is partnering with industry to ensure that Canada's steel makers continue to lead the world in innovation, and that highly qualified Canadian workers are prepared to meet future challenges. The Centre's funding partners include the Ontario Research and Development Challenge fund, NSERC, and Materials and Manufacturing Ontario.

NORTHERN SOLUTIONS TO NORTHERN NEEDS

Nipissing University works with community partners to meet their educational and data needs. Recent joint programs between Nipissing and Canadian College training science, criminal justice respond to specific regional training needs. The University co-operates with organizations such as the Ministry of Natural Resources in applied research, and is also home to a Community Research Centre. Established by the Community Partners Group, which represents many North Bay interest groups, the Centre helps gather and analyze community data for economic and social development projects.

BIOTECHNOLOGY COMPANY BUILT ON DISCOVERY BY UNIVERSITY SCIENTISTS

In 1993, University of Ottawa scientists identified a gene which inhibits apoptosis, the process of programmed cell death which research links to a significant majority of human diseases and injury states. This discovery provided the technology platform for ApoptoGen, a \$40 million, 34 person biotechnology company, which recently merged with Angera Therapeutics. Angera now holds some 30 patents for therapeutic applications of apoptosis, has completed agreements with two major American biotechnology companies, and has generated major insights into potential treatments in cancer and neurodegenerative disorders.

A FARMER'S COMMERCIALIZATION MODEL

Queen's University operates its own not-for-profit corporation to commercialize its intellectual property, PARTIQ Innovations, the most profitable not-for-profit transfer office in Canada, has helped create some 25 spin-off companies, employing more than 130 people. Innovations funded by PARTIQ include a drug with the potential to treat Alzheimer's, therapies for pre-cancerous skin lesions, and technologies for improving the yield and drought resistance of important crops. PARTIQ manages a \$1 million venture fund that has invested in eight Kingston-based companies to date.

IN THE VANCE AND BOUNDARY IS NEW MEDIA PRODUCTION

Queen's University's Interactive Broadcast Development Group (IBDG) is accelerating the convergence of the broadcast, cable, media, and other industries by creating and studying various prototypes of interactive broadcast content. The IBDG aims to stimulate interactive broadcasting in Ontario through its innovative thought at Ontario (IBDO initiative 100) — a cross-sector group of new media content creators, broadcasters, cablecasters, educators, and the business sector — will develop and market test 10 innovative broadcast productions to demonstrate the economic viability of innovative producers to traditional broadcasters and new media companies alike.

CONVERTING POLYMER TO POLYMER

MULTI-STEP WITH HIGH PERFORMANCE ENGINEERED POLYMER

University of Toronto chemical engineering researchers held a patent for a unique polymer modified asphalt (PMA) produced from stabilized polyethylene. Through the University's Innovation Foundation, the technology was licensed to a Toronto businessman who then founded Polyphab Inc. to market the existing new product. Over the last decade, PMAs have significantly improved durability and performance, and are rapidly overtaking the large international market in paving applications — from commercial and residential roofing to industrial applications, such as canals, sealants and coatings.

FROM COLLEGE TO COMMUNITY

PERSONAL RESOURCES FOR COMMUNITY BETTERMENT

The Trent Centre for Community Based Education has been enhancing the social and economic health of the Peterborough area for five years. A joint project of Trent University Peterborough Social Planning Council and the Community Opportunity and Innovation Network Inc., the program provides opportunities for students, faculty, and local organizations to pool their resources and work together on community-improving projects. Trent students are placed with organizations in the surrounding region to assist them with research, planning, and community development initiatives.

CLUSTERING FOR ECONOMIC GROWTH

A REGIONAL DYNAMIC FOR ECONOMIC GROWTH

The University of Waterloo (UW) has helped lay the groundwork for entire partnership and economic development in the Kitchener-Waterloo area. The University is recognized as a central catalyst for the area's economic revitalization, both through technology transfer — UW has formed and fostered many information technology companies — and through partnerships such as the 'Netted Networks Institute for Advanced Information Technology. This partnership, which includes Nortel, UW and the federal and provincial governments, will result in advances in cluster computing, active networks, wireless networks, and network management.

DETERMINING THE ECONOMIC IMPACT OF NEW MEDIA ON THE INDUSTRY

Vision Therapeutics Inc. is a biotechnology company founded in 1997 by the Johns F. Roberts Research Institute in partnership with The University of Western Ontario and the London Health Sciences Centre. Vision has already developed several therapeutic approaches to treat inflammatory and immune-based disorders using a no-horology platform that exploits immunomodulatory strategies of various, by harnessing the adaptive nature of specific viral proteins. Vision is developing compounds that may potentially treat conditions such as rheumatoid arthritis, organ transplant rejection, and cardiac muscle diseases.

CLINICAL TRIALS FOR INTERVENTIONS FOR PEOPLE WITH SPECIAL NEEDS

Wilfrid Laurier University is the site of the only university-based multi-therapy clinic in Canada. Its methods trained in mental and therapeutic process work with sensory impaired children, developmentally delayed children and adults, multi-handicapped children, adolescents with emotional disorders, adults with physical handicaps, individuals with Down's syndrome, autism, children, and people in palliative and chronic care. The program provides more than 100 individuals weekly at local schools, day care centres, and seniors' residences/centres as well as at our campus clinic.

COMMUNITY-DRIVEN SERVICES

CLINIC MAKES CRIMINAL SERVICES ACCESSIBLE TO ALL

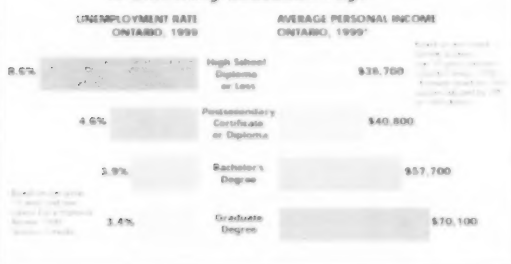
A joint project of Legal Aid of Ontario and the University of Windsor's Faculty of Law provides legal and social work assistance to those who cannot afford a lawyer and cannot obtain a Legal Aid Certificate, including low-income earners, the unemployed, social assistance recipients, senior citizens on pension income, and students. Staffed by lawyers, social workers, and Windsor students, the clinic conducts traditional legal and social work services as well as engaging in public legal education, law reform activities, research, and community development.

CLINICAL TRIALS FOR INTERVENTIONS FOR PEOPLE WITH SPECIAL NEEDS

A recent study by York University professors, reported in the *Canadian Medical Association Journal*, shows ill health through inactivity cost Canadian \$2 billion last year in health care, or 2.5 percent of total, preventable direct health care costs. The authors estimate that more than 71,000 lives were lost in 1990 owing to illnesses directly attributable to physical inactivity. They urge public health campaigns directed at increasing physical activity in the population that are as aggressive and persistent as anti-smoking campaigns.

and Strategy 2.

A University Education Pays



5. Through the cost avoidance benefit from university graduates' higher levels of philanthropic activity relative to high school graduates.

The Enterprise Canada report also calculates the value of our graduates' contributions to Ontario's charitable organizations — religious, education and research, health, culture, arts, and recreation — through giving and volunteering. In 1990, university graduates donated \$400 million more in funds, and significantly more volunteer

hours than their high school counterparts.

Assuming conservatively that at least 50 percent of their dollars and time were directed to sectors that fall largely (if not entirely) under the provincial government's mandate, the philanthropic activity of university graduates created an estimated cost avoidance benefit of \$283 million a year.

These five components do not even begin to capture the full range of benefits that Ontario reaps from its universities, even from a purely eco-

nomic standpoint. Among the many economic factors they do not measure are the impact of non-proprietary (public good) university research on economic innovation, the contributions of universities to their host communities, the value of corporate enterprises created and/or managed by university graduates, and the role of universities in attracting new capital investment to the province. A full accounting would also, of course, include our universities' contributions to Ontario's social, cultural, and intellectual development — contributions that lie beyond that

which can easily be counted, tallied, and valued.

Even within their narrow terms of reference, however, the findings show convincingly that Ontarians receive a significant, tangible economic benefit from their long-term investment in Ontario universities — a benefit that is paid out annually to support economic growth and job creation in the province. It is in everyone's interest to support a funding review of plan that will strengthen Ontario universities as a leading engine of economic opportunity for the people of this province.

University graduates: higher spending power translates into jobs.

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